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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,385	12/04/2001	Natale Aiello	00-CT-252/DP	7006

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EXAMINER

RO, BENTSU

ART UNIT PAPER NUMBER

2837

DATE MAILED: 05/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/005,385

Applicant(s)

AIELLO ET AL.

Examiner

Bentsu Ro

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7-15 and 17-20 is/are rejected.
- 7) ☒ Claim(s) 6 and 16 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

FIRST OFFICE ACTION

1. Drawing corrections are required as follows:
 - Applicant should label Figs. 1 and 2 as "prior art".
 - Label Fig. 1, item 8 as a "control device" or a "controller".
 - Label Fig. 3, item 17 as a "first control device" and item 18 as a "second control device".
2. Specification correction is required as follows:
 - Page 7, line 6, change the phrase "common point 15" to --common point 23--, see Fig. 3.
3. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 1, 10, 11, 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims are rejected because of the following reasons:

Claims 1 and 11 each calls for a first and a second control blocks, whileas claims 10 and 20 depending on claims 1 and 11 respectively, each calls for a single control block. Thus, applicant is claiming "two separate control blocks" or "a single control block" is unclear.

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5, 7-15, 17-20 are all rejected under 35 U.S.C. 102(b) as being clearly anticipated by applicant acknowledged prior art Figs. 1 and 2.

Claims 1-5 and 7-10 are first group claims and claims 11-15 and 17-20 are second group claims. These two groups of claims are basically identical except the first group claims are claiming "a driving circuit" whereas the second group claims are claiming "an electronically switched motor", or these two groups of claims are identical otherwise.

Because the claims are identical, explanation will be given to the first group claims only.

The following chart compares the claimed subject matter and the prior art teaching.

The first group claims:

Claim 1. A driving circuit for an electronically switched motor, said driving circuit comprising:

a supply voltage rectifying stage for providing a rectified supply voltage;

first and second control blocks;

first switching means for switching state based on at least one output signal of the first control block;

magnetic means for providing a magnetic flux according to the state of the first switching means;

a plurality of transmission diodes for transmitting an exciting current that flows through the magnetic means;

first energy storing means for storing the exciting current flowing through the plurality of diodes;

an energy return stage for transferring the energy stored in the first energy storing means to the rectifying stage;

second switching means controlled by an output signal of the second control block; and

Applicant's Figs. 1-2 "prior art" teaching:

See applicant acknowledged prior art Figs. 1 and 2;

Fig. 2 shows a rectifier stage 11;

Fig. 1 shows a control device 8, the control device has a first control block (or a first control portion) for controlling power switches T1-T3 and a second control block (or a second control portion) for controlling a chopping switch Td;

the power switches T1-T3;

Fig. 1 shows motor phase windings U, V and Z;

Fig. 1 shows diodes D1-D3;

Fig. 1 shows a energy storing capacitor Cd;

Fig. 1 shows an energy return stage 10;

Fig. 1 shows a chopping switch Td;

energetic conversion means for receiving the energy stored in the energy storing means through the second switching means that is controlled by the output of the second control block,

so as to provide a current as sinusoidal as possible.

Claim 2. The driving circuit according to claim 1, wherein the energetic conversion means includes a high frequency transformer

having a predetermined spire ratio.

Claim 3. The driving circuit according to claim 1, wherein the second switching means is in series with at least one part of the energetic conversion means.

Claim 4. The driving circuit according to claim 1, wherein the first switching means and the second switching means are in low side configuration.

Fig. 1 shows an inductor L1;

first, the inductor L1 has an filtering effect that converts a positive going rectangular wave into a positive going sinusoidal wave (0-180°) and a negative going rectangular wave into a negative going sinusoidal wave (180-360°);
secondly, the words "as sinusoidal as possible" is merely a desired result, it is a possibility but not a mandate;
thus, the output of inductor L1 is a sinusoidal wave or the output of the inductor L1 is not a sinusoidal wave is not mandatory.

An inductor is a type of transformer;

claims do not define a primary winding and a secondary winding, therefore, any transformer can be used as an inductor in that only one of the windings is used and connected as an inductor as required by claim 1.

The bottom terminal of the inductor L1 is connected to the left terminal of the chopping switch Td, this type of connection is a series connection, see Fig. 1.

Fig. 1 shows power switches T1-T3 as well as the chopping switch Td which are all connected toward the low voltage side of the input terminal (i.e. ground terminal), thus, they are in the "low side configuration".

Claim 5. The driving circuit according to claim 1, wherein the second control block provides the output signal that controls the second switching means according to a pulse width modulation driving technique.

Claim 7. The driving circuit according to claim 1, wherein the first switching means and the second switching means are formed by bipolar transistors each having its emitter electrode connected to ground.

Claim 8. The driving circuit according to claim 1, wherein the first switching means and the second switching means are formed by MOSFET transistors each having its source electrode connected to ground.

Claim 9. The driving circuit according to claim 1, wherein the first switching means and the second switching means are formed by IGBT transistors each having its source electrode connected to ground.

Claim 10. The driving circuit according to claim 1, wherein the first control block and the second block are portions of a single control block.

The "chopping" switch Td is based on a chopping technique, which is also a pulse width modulation driving technique.

All the switches T1-T3 and Td can be any type of switching devices, including a transistors, a FET, an IGBT, etc; if a transistor is used, one of the most commonly used connections is a common-emitter connection, which connection has the emitter of the transistor connected to the ground.

Applicant should refer to most microelectronic circuit textbooks for the transistor connection, such as Sedra/Smith, "Microelectronic Circuits", 4th Edition, Oxford University Press, Oxford, 1998, Chapter 4, "Bipolar Junction Transistors (BJTs)".

Same reason as claim 7;
see Sedra/Smith textbook chapter 5, "Field-Effect Transistors (FETs)".

Same reason as claim 7.

Fig. 1 shows a single control block 8.

7. Claims 6 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

These claims are allowable because no prior art teaches a "hysteresis" driving block as shown in applicant's Fig. 3, the hysteresis block 28.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication should be directed to Bentsu Ro at telephone number 703 308-3656.

April 28, 2003

Bentsu Ro
Bentsu Ro
Primary Examiner